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LOCOMOTOR ATAXIA AND THE UROLOGIST.

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WERE it not for the fact that the most trite and commonplace phenomena of clinical medicine and surgery have continued to mystify and elude successive generations of medical men, the pursuit of the practice of the healing art would, long since, have lost its charm.

The vermiform appendix, for example, continues year after year to manifest its morbid capabilities under conditions so multiform, that even the keenest surgical minds are constantly compelled to admit their impotency to unravel the pathologic mysteries of this most useless portion of the human body.

The other component parts of the abdominal contents are nearly, if not quite, equally capable of leading even the most astute operators so far astray in their activities that the results of their operations would be laughable, if they were not of such serious import to their unhappy victims.

Hardly any surgeon is to-day willing to pin his faith to any hard and fast diagnosis when some surgical condition of the abdominal cavity or pelvis is in question. Relying on his ability to invade either region with impunity, he prefers to operate first and make his diagnosis afterwards; and this is all very well if some morbid condition essentially abdominal or pelvic underlies the clinical picture that decides the operation.

Far different is it, on the other hand, when the surgeon, guided merely by the superficies of the case, invades the pelvis or the abdomen in pursuit of morbid conditions whose real seat is quite remote from these regions.

The purpose of this preliminary generalization is to attract

the attention of the general surgeon, and particularly of the specialist in genito-urinary surgery, to the temptations to which they are continually yielding in operating for the bladder and kidney complications of a disease which is as far remote from the province of surgery as anything could well be. The writer refers to that insidious, elusive and protean disease of the sensory side of the nervous system—locomotor ataxia.

The mechanism of normal urination is an elementary phenomenon of physiology. We all know that, in the normal person, the presence of a certain amount of urine in the bladder is the signal to the brain to bring about a desire to void this waste product. We know, furthermore, that this desire is the end result of a reflex action and that this reflex action results primarily from the normal functioning of sensory nerves whose specific duty is to warn the brain when the time has arrived for the latter organ to relax its inhibitory vigilance upon the sphincteric apparatus of the bladder and allow the collected urine to pass.

In locomotor ataxia we are dealing with a disease which involves the sensory nervous system only. Hence it immediately follows that the sensory portion of all reflex mechanism suffers early and severely in this disease.

The veriest tyro in neurologic diagnosis knows that the loss of the patellar and pupillary light reflexes answers the most essential diagnostic requirements in locomotor ataxia and yet nearly everybody, outside of the practised clinician, fails to remember that the sum total of reflex loss is by no means made up of the two portions of the reflex system above mentioned. On the contrary, the vesical reflex plays a most important role in the disease in question and the possibility of its abolition should never for a moment be lost sight of. Furthermore, the fact should always be borne in mind that the first reflex mechanism to be attacked in locomotor ataxia is largely fortuitous and that the primary point of election may lie in the bladder, as logically as anywhere else. Remembering this, the surgeon will save himself from many a regrettable operative interference and his patients from ordeals which they can ill afford to undergo.

Briefly outlined, the sequence of events which lead to superfluous operating in cases of locomotor ataxia is as follows. We will take a typical case. A previously apparently healthy

individual, aged anywhere from twenty years upward, suddenly begins to have considerable spontaneous pain in the bladder, the pain being associated with noticeable interference with the free and complete passage of urine. A surgeon is called, hears the story and without more ado takes the matter of stone into consideration. After a shorter or longer period of time the pain subsides as quickly as it came and a pain-free interval follows. Attack follows attack, however, and the question of operation grows more and more imminent. The painful crises are growing more and more frequent and severe and, in addition, a constant dribbling of the urine has established itself. The next chapter of the clinical history is marked by an operation which uncovers—nothing; and from this point on operation may follow operation, each quite as fruitless and superfluous as the one before.

Meantime the original cause of the pain and dribbling, the locomotor ataxia, continues quite as active as before the primary operation. Indeed it is not at all unlikely that the successive interventions have given a new impetus to the process; and the victim is doubly miserable by reason of the traumatisms which, in spite of his debilitated nervous system, he has been compelled to undergo.

Let it not be thought that vesical calculus is the only erroneous diagnosis that leads to unnecessary surgical interference in the class of cases under consideration. The writer's note book contains more than one history of tabetics who have been cut for stone in the kidney or have had their prostate glands explored in search of a supposed hypertrophy. And, on the surface, none of these operations seems so wild and devoid of indications as the actual facts prove them to be. A great many of the vesical and renal crises of locomotor ataxia bear a close superficial relation to the conditions obtaining in cases of vesical and renal calculi and many others, in the same surface way, practically parallel the clinical features of hypertrophied prostate. A goodly number, on the other hand, are only so remotely similar that a mistaken diagnosis leading to surgical operation is absolutely inexcusable.

How may a surgeon safeguard himself against errors of diagnosis which are apt to lead him into the unnecessary and fruitless operations above mentioned? By remembering that the initial symptom of locomotor ataxia may in any case be urinary

incontinence, and also by bearing constantly in mind that not only in the beginning of the disease but at any time during its progress the patient may undergo vesical and renal crises, so-called, of which the clinical manifestations bear a very strong superficial resemblance to those of renal or vesical calculi. Having these possibilities in mind, the surgeon should approach every supposedly renal, vesical or prostate case with the greatest possible circumspection. If he is able to obtain a history of syphilis his circumspection should be redoubled. If the case is really one of locomotor ataxia, careful questioning will reveal the fact that although the urinary disturbance is the factor which is at the moment of paramount importance in the mind of the patient, it is far from being the only one in a given case. Even in cases where urinary incontinence is the earliest gross evidence of the disease, it will be found that the patient has, for a considerable time prior to this, been the victim of fleeting pains of a neuralgic character; that he has not been quite sure of his footing in going over the stairs or in making his way about in the dark; that he tends to pitch forward over the washbowl when his sight is obscured by a towel or washcloth; that he has occasionally seen double or experienced other visual disturbances, and that he is unaccountably susceptible to atmospheric conditions.

The above necessarily involves a considerable amount of detail work, to which many surgeons—for some unaccountable reason—seem to possess an ineradicable aversion, but the necessity for detail work in surgery is a matter that requires no special argument.

The actual physical exploration presents no insuperable difficulty. It is true that not all cases of locomotor ataxia are absolutely typical, and for diagnostic purposes—even though the diagnostician be an avowed tyro—it is not necessary that they should be. It is enough for all practical purposes that the pupils do not respond to light—while retaining their power of accommodation—and that the knee and Achilles jerks are abolished or obviously diminished. If the surgeon discovers even this much, he has gone far enough to know, if he be wise, that the case in hand is one in which operation will lead to nothing but chagrin on his part and fruitless suffering on the part of his patient.

PYELITIS.

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MODIFICATION of the ureter-cystoscope, making catheterization of ureters easier, has led to a more thorough study of diseases of the renal pelves, and pyelitis is now considered a not uncommon condition. Rayer,[1] the first man to recognize pyelitis as a particular affection, stated that the inflammation might extend to the parenchyma of the kidney. Since his time pyelitis has been more or less thoroughly described, yet in searching through literature one is surprised that many text-books ignore the disease, while others mention it only cursorily.

Of the authors who discourse on pyelitis, a majority describe both catarrhal and purulent varieties, while some speak of purulent only. Michaelis[2] declares purulent pyelitis to be rather rare, but says that catarrhal pyelitis is quite common; that it is considered rare because it occurs as a complication of surgical troubles. The physician who will thoroughly investigate his cases of obscure urinary disturbance, will be startled at the frequent occurrence of pyelitis. Catarrhal pyelitis is far more common than the purulent.

Pyelitis may be caused by an extension of inflammation from the neck of the bladder. Catarrh of the vesical trigone, or purulent cystisis, may extend up the ureters and so to the renal pelves. Especially is this so if there be an obstruction to the flow of urine from the bladder. Pyelitis may be occasioned by extension of inflammation from the kidney. The irritating action of oxalate of calcium and uric acid, if long continued, produces pyelitis as well as nephritis. It is asserted that pyelitis may be caused by infectious fevers, but it is problematical whether inflammation may not, in those cases, originate in the kidney. A primal agent of pyelitis

[1] *Krankheiten der Nieren;* Rayer, Erlangen, 1844.

[2] Zur Lehre der Pyelitis. By Michaelis. (*Wiener medizinische Presse,* 11, 1870, p. 594.)

is declared to be renal calculus, yet it is probable pyelitis may be present before the appearance of calculus and may be a contributing element in its formation. The majority of authors give the long continued ingestion of renal irritants, such as oil of santal and cantharides, as one of the causes of catarrhal pyelitis. Gonococci have been found in pus from inflammation in the renal pelves, but precisely the method of invasion has not been determined. It is claimed by some that the ureteral orifices remain open while the bladder is partly full and that a Janet irrigation may force pus into them. I do not consider this probable. Having repeatedly noticed ureteral orifices in a large number of cases, I have observed the majority to be closed except during the passage of urine into the bladder, the amount of fluid in the bladder not influencing this in the least. Yet in a few patients the ureters are always gaping. A case reported by Lancereaux[3] in 1860, seems to prove the theory of danger in irrigating the bladder. His patient, a young man, experienced severe pains in the region of the kidneys immediately after using a hand injection for the cure of gonorrhea. Necropsy showed a purulent pyelo-ureteritis with perinephritic abscess. The lower part of the ureter, however, was not so acutely inflamed as the upper.

At the present day a cause of pyelitis which must not be overlooked is instrumentation of the ureter. The insertion of an ureteral catheter not absolutely sterile or the passage of a sterile catheter through an infected bladder may cause pyelitis, or may change a catarrhal to a purulent pyelitis.

Tubercular pyelitis is found secondary to tubercular nephritis.

Casper[4] gives as causes of pyelitis: infection from general circulation of the blood—hematogenous; through the urinary tract against the flow of urine—urogenous infection; and finally, micro-organisms which may wander into the kidneys directly from neighboring organs.

PATHOLOGY. (From Morrow's *System of Genito-Urinary Diseases.*)

[3] Pyelite, Phebite de la Veine Rénale, Abcès Du Rein Droit, Infection Purulente, Albumine dans l'Urine. By M. Lancereaux. (*Mémoires de la Société de Biologie,* 1860, p. 17.)

[4] Lehrbuch der Urologie. (1903). By Leopold Casper.

" The catarrhal form shows a thickened and injected mucosa with rapid formation and desquamation of epithelium, and the process involves by direct propagation the tubules of the pyramids. In the more severe forms there is a fibrinous exudation, that adheres in part to the surface and is carried away as shreds in the urine.

" In the acute purulent form there is a round-celled infiltration of the wall of the pelvis, the mucosa is greatly thickened and irregular, with numerous small extravasations of blood and scattered points of superficial sloughing and ulceration. The kidney substance on section shows small white streakings through the cortex and medulla, and later punctate foci of suppuration or larger abscesses formed by confluence of the small ones. The suppuration appears to begin in the pyramids by the agency of bacilli that have made their way directly into the tubules from the pelvis. The pus that forms on the free surface is either carried away in the urine, or, if the ureter is obstructed by the inflammatory swelling of its own wall or by a fibrinous plug, it collects within the pelvis.

" The chronic purulent form may be the later stage of the acute, or it may be chronic from the beginning. It gradually destroys the parenchyma of the organ, partly by suppuration and partly by the formation of interstitial connective tissue, and as the escape of the contents of the pelvis through the ureter is always opposed and at times entirely prevented, more or less distension of the kidney ensues."

From the foregoing, it must be deduced that the continuance of pyelitis, be it catarrhal or purulent, is a direct menace to the kidney, catarrhal pyeltitis terminating in nonmicrobic nephritis, or Bright's disease, and the microbic form inducing supurative nephritis, or surgical kidney. All writers of general medicine give as the occasional cause of Bright's disease an ascending inflammation from the renal pelves. They also speak of a very large number of nephritis cases in which no assignable cause can be found. It is my opinion that many of the latter have their origin in an unrecognized catarrhal pyelitis.

Symptoms of Catarrhal Pyelitis.—As has been stated, pronounced catarrhal pyelitis almost invariably invades the kidney, so that a description of symptoms is really that pertaining to pyelonephritis. Urination may be disturbed. There may be frequency, micturition becoming obligatory every two hours, or

oftener, and occasionally by night. Some patients complain of frequency while seated, experiencing none or little on standing. The act of urination is usually normal, though certain cases present all symptoms of spasmodic stricture. In mild types there may be no pain referable to the kidney, but in severer ones it is quite a pronounced symptom. Usually, it is referred to the back, in the region of the kidneys; along the course of the ureter and not infrequently in the testicle. A " weak back " is a common symptom. Occasionally the pain is referred to the epigastric region. Besides these indications there is a feeling of malaise corresponding to the amount of nephritis present. In many instances of advanced nephritis, if patients be closely questioned, a prodromal period will be found to have existed lasting from a few months to a few years, in which all the symptoms above described were experienced.

In appearance, the urine is almost identical with that of catarrhal inflammation of the bladder, or prostate. The second specimen has a granular semblance and as it cools, forms a mucus cloud. It is impossible by the naked eye to absolutely determine whether the cloudiness be due to pyelitis, or to other conditions named, but if subjective symptoms be found in addition, a thorough investigation of the renal pelves should be made. Especially important is this if the patient has had appropriate treatment of the prostate and bladder.

Symptoms of Purulent Pyelitis vary according to the intensity of the inflammation. In some cases none exist other than those described for catarrhal pyelitis, excepting that the urine contains large amounts of pus if the ureters be patulous. In acute and subacute inflammation there is always considerable general disturbance; septic fever with chills, loss of flesh and growing weakness. The whole appearance is as of one suffering from septic absorption. Fevers are irregular, running up to 102° or 104° in the afternoon and up to 101° or 102° in the morning. Sometimes they are extremely irregular, reaching their highest at any time of the day. Chills are usually slight, but may be very severe. The more pronounced the general symptoms, the more deeply is the kidney involved.

Course of the Disease.—Catarrhal pyelitis may entirely disappear under appropriate internal treatment, but it usually persists, invading finally the tubules of the kidney. The process of

infringement is ordinarily very slow and several years may elapse before the function of the kidney is disturbed to any great extent. Or the patient, by exposure, may bring on an acute, or subacute attack of nephritis. Mucus constantly secreted by the inflamed pelvis may catch up crystals of uric acid and so originate a calculus. Phosphates, at times, are unquestionably deposited on the inflamed membrane.

Acute purulent pyelitis usually extends swiftly to the kidney, producing suppurative nephritis and sometimes, perinephritic abscess; or the ureter may become plugged by intense inflammation and so cause pyonephrosis with rapid destruction of the kidney. Unless this condition be relieved, death follows quickly. Chronic purulent pyelitis may exist for some time without marked involvement of the kidney, but sooner or later the infection spreads to and slowly destroys it.

Diagnosis.—Dependence must be placed on the microscope for diagnosis of catarrhal pyelitis. If, after the regulation of diet and the administration of urinary antiseptics, pelvic epithelium be found in the urine on repeated examination, a diagnosis of catarrhal pyelitis may be made. The irritating action of oxalate of calcium and uric acid produces desquamation of both pelvic and tubular epithelium and it is sometimes impossible to bring about an entire disappearance of these crystals. In such circumstance, the character of epithelium must be studied and upon discovery of degenerated cells from the deeper layer, a diagnosis of true inflammation may be safely made. In arriving at conclusions, subjective symptoms must also be considered. It is seldom that a patient has pains over the kidney due to lithaemia alone. Pain along the course of the ureter and in the testicle helps to ratify diagnosis. The aches of lumbago must not be ascribed to pyelitis and, on the other hand, annoying pains in the back must not be called lumbago until all possibility of inflammation of the renal pelvis has been excluded. Cloudy urine drawn through the vesical catheter is indicative of cystitis, ureteritis or pyelitis, unless acute or subacute posterior urethritis, prostatitis, or seminal vesiculitis be present.

It is more difficult to make a diagnosis of purulent pyelitis by microscopic findings because the presence of much pus obscures the field, making epithelium difficult to discover. The pelvic cells are

much denormalized, so that only the most expert microscopists are able to determine their origin. Chief reliance is based therefore on clinical observation. If the second specimen of urine contains an amount of pus out of proportion to bladder symptoms present, the case must be regarded as one of possible purulent pyelitis. It is a well known fact that in elderly males considerable cystitis may exist without many bladder symptoms. In younger men, however, this is not the case. The character of the pus must be studied. If it be ropy and possess considerable mucus, in all likelihood it originates in the bladder, but if it be granular and contain little mucus, it probably comes from the renal pelves. Again, if it be ropy, there may be pyelitis in addition to cystitis. In washing out bladders, when the return flow becomes quickly clear, yet swiftly clouds again, pyelitis may be strongly suspected. If the bladder be slow to clear and slow to cloud, pyelitis is probably not present, the pus in all likelihood coming entirely from the bladder.

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To still further examine, an observation cystoscope may be inserted in order that the orifices of the ureters be studied. If they are inflamed and everted and if the urinary jet be cloudy, pyelitis or ureteritis may be safely inferred. Fenwick[5] in speaking of renal pyuria says:

"A stream of pus issuing from the ureteral orifice is not quite so readily or so certainly detected as a jet of blood, but it can be diagnosed with care. The glycerine-like stream of health is replaced by a muddy current of a color which varies from a light straw to a dark yellow."

If the ureteral catheter be passed and urine collected diagnosis is absolutely established. If, however, in observing the ureteral orifices, clear urine be seen to issue from one side, that side should not be catheterized. If a severe cystitis be discovered, the ureters should not be catheterized until the cystitis has been brought under control.

Acute and subacute purulent pyelitis may be recognized by general symptoms taken in conjunction with urinary ones. Palpation over the kidney discloses more or less tenderness, and, in cases of pyelonephritis and pyonephrosis, more or less tumifac-

[5] Electric Illumination of the Bladder and Urethra. By E. Harry Fenwick, London, 1889.

tion. The intercurrence of acute pyelitis in the course of cystitis is indicated by an exacerbation of all the symptoms together with fever and chills. Especially is pyelitis to be considered if the exacerbation of symptoms occurs after instrumentation of the bladder.

A urine that is at one time perfectly clear and at another full of pus, usually indicates pyelitis accompanied by obstruction in the ureter, such as calculus, stricture or kinking.

I have selected two cases as illustrative of the two forms of chronic pyelitis:

CASE 1. Mr. B.; minister; age, thirty-five; was referred to me by Dr. Hawkes, of Newark, on April 3, 1905. The patient stated that he had never had a veneral disease of any kind. Eight years ago he first remarked a slight hesitancy on, and dribbling after urination. Six years ago he consulted a physician who told him he had stricture. Sounds were passed, but no improvement followed treatment. At about the same time he noticed considerable pain over the course of the sciatic. This was diagnosticated as neuritis. Shortly after he experienced aches in the back and along the course of the ureter. Beginning about the first of March, he observed considerable pus in his urine, which, however, urotropin removed to quite an extent. His pains and hesitancy continued with more or less severity up to the time he was sent to me. He then complained of a constant desire to urinate, though it was possible for him to hold his water for three or four hours. There was marked hesitancy in starting the stream, ten or fifteen minutes sometimes elapsing before the urine could be induced to flow. The jet was small and frequently twisted. There was moderate pain in the lion, over the course of the ureter, in the testicle and over the suprapubic region. All his symptoms were lessened on lying down and aggravated by walking. Examination discovered the urine to be quite granular in appearance. Urethra normal. Prostate and vesicles normal. Kidneys in position and barely tender. The cystoscope showed his bladder to be congested at the base and over the trigone and the ureteral orifices were seen to be reddened and slightly everted. The ureters being catheterized, were found to be hypersensitive, though there was no obstruction whatever to the passage of the catheter to the renal pelves. Upon removal of the cystoscope,

urine was collected for examination. It was at first seen to be somewhat cloudy, but later blood manifested itself, showing that the ureteral catheters were irritating the ureters. In similar cases I have observed this phenomenon invariably, together with the fact that the longer catheters remain in the ureters, the greater becomes the percentage of blood. On the other hand, when hemorrhage is due to direct traumatism of the ureter, blood will appear with the first urine and later will cease. Dr. Heitzman's report of microscopic findings was chronic pyelitis with mild parenchymatous nephritis.

Mr. B. has received twenty lavages of the renal pelves. As a result, all his symptoms have disappeared. Even the aches in his legs have been somewhat mitigated and are now felt only during heavy weather. There is always, during these periods of pain, a limited amount of uric acid in his urine. Mr. B. has gone to Europe and will resume treatment upon his return. The case is one of catarrhal pyelonephritis probably caused by uric acid. In all likelihood, it began as catarrhal pyelitis eight years ago, at that time escaping detection. When he came to me his urine contained one-fourth of one per cent. albumin and granular casts. Now, it shows the smallest trace of albumin, and casts have entirely disappeared.

Case 2. L. M., salesman; age, twenty-four; was referred to me November 26, 1904, by Dr. Schneider, of New York. He said that his first and only attack of urethritis began in November, 1903. He was pronounced cured in six weeks. On February 10, 1904, he noticed a slight pain at the head of the penis on urination and on inspecting his urine, found it to be very cloudy. He immediately returned to his physician who made a diagnosis of cystitis and treated him by lavage of the bladder and internal use of urinary antiseptics without result until November, when he consulted Dr. Schneider who thereupon sent him to me for examination. On November 26, his only symptoms were slight pain at the meatus on micturition, moderate frequency, a little pain in the suprapubic region and an exceedingly cloudy urine. Urethra, prostate and vesicles were normal. A cystoscope in the bladder showed that organ to be markedly inflamed, especially at the trigone, which was thrown up into folds and knobs of mucus membrane. The right ureter was catheterized with ease, but

owing to irritability of the bladder and marked inflammation about the left ureteral orifice, it was impossible to enter that side on his first visit. Urine from the right side was comparatively clear and on examination showed only slight catarrhal pyelitis. On his second visit I succeeded in entering the left side and obtained through the catheter exceedingly purulent urine. Examination by microscope evidenced ureteropyelitis without involvement of the kidney. He was treated eleven times, at first with silver nitrate, then with protargol and finally with argyrol. His urine cleared absolutely and all symptoms vanished. There has been no return of trouble in six months.

Treatment.—The treatment of pyelitis is both systemic and local. Catarrhal pyelitis should be treated first by rest, diet, internal medication and change of climate. Repose in bed is not necessary, but rest from arduous labor, athletics and close application to business, must be insisted upon. A plain, nutritious diet is essential and in cases of kidney involvement, a very restricted diet should be given as for advanced nephritis. Internal medication consists in the use of salol, urotropin, cystogen, etc., and the ingestion of large quantities of mineral spring waters. Usually inflammation persists and lavage of the renal pelves is indicated to prevent irreparable harm to the kidney.

Chronic purulent pyelitis may sometimes be made to disappear entirely by the use of urinary antiseptics combined with rest in bed. Too much time should not be wasted, however, before resorting to lavage. No operation should be performed until lavage has been tried in an attempt to save the kidney. If urinary analysis prove it to be practically destroyed, lavage of the pelves is useless and the kidney remains must be removed.

Acute and subacute purulent pyelitis should be treated by rest in bed, urinary antiseptics and stupes applied over the kidney. Desnos [6] in discussing a paper by Albarran cites a case " of grave pyelonephrosis; catheterism was followed by an intense chill, the general condition was rapidly aggravated and the patient died the third day." However, it seems a rational treatment to introduce antiseptics in order to clean out pus from the seat of inflammation. If it be decided upon to employ lavage, catheters

[6] Traitement des Pyelonephritis par le Lavage du Bassinet. By M. Albarran of Paris. (Annales des Maladies des Organs Genito-Urinaires, 16, 1898, p. 1283.)

should be passed well up to the kidneys and left in place for days, the pelves being lavaged thoroughly several times every twenty-four hours. By this means the ureter is kept open, allowing free drainage, pus is washed out and an antiseptic brought in direct contact with the inflamed area. If the kidney be the seat of suppurative inflammation lavage is unserviceable.

In 1888, Reginald Harrison [7] reported having washed out the renal pelves by distension of the bladder, causing a back flow along the ureter. In 1894, Howard Kelly [8] described the treatment of pyelitis by means of irrigation through a catheter. Casper [9] did likewise the ensuing year. Since then, Albarran,[6] Desnos,[6] Hamonic.[6] von Illyes [10] and Lang [11] in Europe and Tuckerman,[12] Lewis [13] and Johnson [14] in America, have reported good results from lavage of the renal pelves through the ureteral catheter.

Personally, I have found that catarrhal pyelitis may be entirely cured by lavage when all other means have failed and that the necessity of removing the kidney for purulent pyelitis is sometimes obviated if lavage be given early and thoroughly.

Kelly, Casper and von Illyes recommend strong solutions of silver nitrate, Kelly and Casper using one per cent. and von Illyes as high as two per cent. I rarely use stronger than 1:1000, preferring if this fail, to use the newer silver salts. Catarrhal pyelitis and pyelonephritis respond much better to silver nitrate. Purulent pyelitis should be first washed with boric acid in order to clear out pus, then washed with one of the albuminates of silver freshly prepared. My preference is for argyrol five to twenty-

[7] On the Possibility and Utility of Washing out the Pelvis of the Kidney and the Ureters through the Bladder. By Reginald Harrison, F. R. C. S. (*Lancet,* 1888, 1, p. 463.)

[8] Gonorrheal Pyelitis and Pyo-ureteritis cured by Irrigation. By Howard Kelly. (*American Journal of Obstetrics,* 1894.)

[9] Lehrbuch der Urologie. By Leopold Casper.

[10] Du Cathétérisme Thérapeutique des Ureters. By G. von Illyes. (Duetsche Zeitschr. f. Chir., LXXXVI. I, and Semaine Méd., March, 1905.)

[11] Lehrbuch der Geschlechtskranheiten. By Rafin.

[12] A device for Washing out the Pelvis of the Kidney Through the Ureter. By L. B. Tuckerman. (*Cleveland Med. Gaz.,* 1898, 91, XIV, p. 418.)

[13] Ureter-Catheterism: Its Purposes and Practicability. By Bransford Lewis. (*Annals of Surgery,* 1903.)

[14] Lavage in the Treatment of Diseases of the Kidneys. By F. M. Johnson.

five per cent. The wash should be copious; requiring from twenty to forty-five minutes.

In conclusion:

First—Pyelitis has not received the attention in medical literature its importance deserves.

Second—To obtain results from the employment of lavage of the renal pelves, a close study of the conditions found is absolutely essential. This will certainly be followed by an increased knowledge of the pathological conditions of the kidney and its pelvis.

Third—Careful examination of urinary cases will show that many who complain of indefinite symptoms are really sufferers from pyelitis. A recognition of their condition and the use of appropriate treatment will invariably relieve.

Fourth—Lavage of the renal pelves is a recognized procedure in the treatment of pyelitis, being indicated in all cases, with the exception of tubercular and calculous pyelitis, when the inflammation is not relieved by diet, internal medication and rest.

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RENAL NEOPLASMS ORIGINATING FROM ABERRANT SUPRARENAL TISSUE GERMS.

By Dr. Friedrich Peuckert.

THE suprarenal capsules were discovered by Eustacchius, who described them in his *Opuscula anatomica,* published at Venice in 1563, while the accessory suprarenal bodies were described by Morgagni in his work entitled *Epistola anatomic,* which appeared at Venice in 1764. Duverney, in his work *De glandula renali Eustachii,* published in 1751, called these accessory suprarenal bodies "renes succenturiati," a term which later on was given to the suprarenal capsules themselves. Duverney found that these accessory suprarenal capsules were composed of a cortex and medullary substance.

The occurrence of smaller accessory, or separate suprarenal bodies on the surface of the principal organ is a well-known and not an infrequent occurrence. Suprarenal bodies are occasionally

found supplied with a very large number of small suprarenal bodies, especially in the newly born (Marchand). More recent researches show that aberrant germs of this organ may be found at some little distance from the suprarenal body. In 1861 Rokitansky demonstrated the presence of accessory suprarenal bodies between the fibres of the plexus solaris and renalis. In 1866 Kuhn published a number of cases recorded in literature of accessory suprarenal bodies, and says: "in the research of the older publications relative to this subject it should be pointed out that, as a rule, only such should be considered as accessory suprarenal bodies where these are to be found in immediate connection with either the suprarenal body itself, its vessels, or lying in close proximity to the suprarenal body and that their structure, after a careful examination from this standpoint, is proven to be identical with that of the suprarenal capsule." Marchand found heterologous parts of the cortical substance of the suprarenal body between the kidney and genital glands and in the ligamentum latum in 5 newly born or young children, a condition which was confirmed by Chiari in adults. Ajutolo has noted the occurrence of an accessory suprarenal body, composed of cortical and medullary substance, in the left spermatic cord of an infant and Schmorl demonstrated the presence of a swelling the size of a pea situated in the right spermatic cord of an adult, which was connected with the spermatic artery and a vein of the pampiniform plexus, whose structure corresponded to that of a suprarenal body. Furthermore, out of 510 autopsies, he found small tumors on the right lobe of the liver 4 times, which upon examination showed the histological structure of the cortex of the suprarenal body. Most frequently, however, aberrant germs of the suprarenal gland are to be found in the kidney. In times past, these were considered as lipoma or adenoma arising from the kidney tissue until Grawitz demonstrated beyond a doubt that they originated from the tissue of the suprarenal body. When lying in the rental cortex they have a special significance, because they not infrequently give rise to benign or malignant neoplasms.

At the present time it is demonstrated that the substance of the suprarenal capsules, or at least their cortex, originates from an accumulation of peritoneal epithelium, as has been shown by Janosik and Spee. A capillary network grows into this epithelial

accumulation in which the parenchymatous cells are placed directly on the capillaries and all other stroma is lacking. In the zona fasciculata, the capillaries follow a straight line converging together from the centre to the periphery, parallel to one another and connected by numerous transversal anastomoses, while in the zona reticularis they form a very fine network in whose dense meshes the parenchyma cells are arranged in small clusters.

The fact that portions of the suprarenal body cortex are not infrequently detached from, and come in connection with, the neighboring organs has been explained by Grawitz as due to an early decrease in growth energy of the suprarenal body and the loose connection and demarcation of the single strands of the suprarenal body combined with the neighboring organs possessing a greater growth vitality. That the cortex of the kidney is a favorite location for aberrant suprarenal gland germs is shown from the fact that in the early period of development of the fetus, the kidney is surrounded by the suprarenal body. By the increasing growth of the former, portions of the suprarenal body which do not undergo the same development and have penetrated the spaces between the fetal lobuli renales, may become dispersed and after the disappearance of the subcapsular or interlobular lobules, they still persist in all the tissue of the suprarenal body lying in a column of Bertini.

Neoplastic hyperplasia has been observed in the suprarenal bodies, especially in the cortex, which have been termed by Virchow, strumae suprarenals. The formation of circumscribed nodes, located both in the cortex and medullary substance, and which are not infrequently multiple, contain cells which in form and arrangement correspond to the cortex cells and have been designated as adenoma. On the other hand, in the medullary substance tumors of the suprarenal body occur, whose structure resembles glioma (Virchow), which also contains elements similar to ganglion cells (Marchand). While the nodules in the suprarenal body generally occur as accidental benign neoplastic formations, a progressive malignant neoplastic formation may also arise from the suprarenal body and which is characterized as an atypical and progressive development of exuberant suprarenal capsule tissue.

These types of growth occurring in the suprarenal body may

also develop from aberrant germs of this organ, but which is more especially frequent when the latter are included in the cortex of the kidney. Nevertheless, one must assume from the frequency of dispersed germs of suprarenal tissue that only very few develop into true neoplasms, because Schmorl found in 92% of his autopsies these existed. Generally speaking, the growth energy of the aberrant germs is no greater than that of the normal tissue from which they are derived (Benecke). The possibility that malignant growths may be produced from the detached germs of suprarenal body tissue was first suggested by Grawitz and further confirmation of this interpretation was given from numerous other authorities, particularly by Ajutolo, Löwenhardt, Rupprecht, Benecke, Horn and Askanazy. However, a year before the first writings of Grawitz appeared, Marchand had already expressed the opinion that dispersed germs of suprarenal body tissue could give rise to neoplastic formation.

Two instances of tumor formation arising from aberrant germs of suprarenal body tissue developing outside of the kidney have been described by Weiss. In one case the tumor reached the size of an adult head, developing in the left renal region; it had been growing for two years and was operated on by von Eiselberg. The growth lay in close proximity to the kidney, but could be removed by shelling out and consequently was not directly connected with the renal gland. The growth was characteristic, because it had given rise to metastases in the ileopsoas muscle on the same side and, although everywhere only hyperplastic suprarenal, and not metaplastic, tissue had developed, it was malignant in spite of the benign histological makeup of the tissue, which was similar to some thyroid gland growths. The peripheral structure showed rows of the zona fasciculata with clusters of the zona glomerulosa in the center. In the second case a diagnosis of right-sided ovarian sarcoma was made which had extended up to the umbilicus. At the operation, however, which was performed by Prof. Munster of Konigsberg, about two-thirds of the neoplasm became detached when an attempt was made to remove the growth. The removal of the remainder was an impossibility, so the abdominal cavity was packed with gauze and partially closed. The growth was seated between the layers of the broad ligament in front of the uterus and had grown into the right ovary. On

section, other than the hemorrhagic portions, the growth was butter yellow in color on account of fatty metamorphosis of the tumor cells. Microscopically the tumor consisted of a network of capillaries for a stroma, and of tumor cells, which in several places were closely connected with the vessels and were swollen on account of fatty infiltration, while in other parts it had a glassy appearance. What appeared to be gland lumina were apparently only cavities produced by degeneration of the central cells belonging to what were originally compact cell clusters. Many of the cells showed mitosis, a sign of malignancy. It had not as yet given rise to metastases, but the neoplasm had extended to the right ovary and pelvic lymphnodes after the fashion of malignant grows. Lying beside the larger tumor in the broad ligament another small nodule was found, which in structure exactly corresponded with the histologic makeup of the cortex of the suprarenal body.

Before these cases due to Weiss, Chiari had reported a case of neoplastic formation arising from aberrant germs of the suprarenal body, the growth developing between the kidney and the inguinal region. The tumor was characteristic, inasmuch as it grew very rapidly, penetrating into the coecum and mesentary, giving rise to no metastases properly speaking, but to a local recurrence. A case examined by Ribbert of a neoplasm of the pancreas, operated on by Krönlein, should also be mentioned.

In 1883 Grawitz first demonstrated that a series of renal tumors, which until that time had been classified under the head of lipoma, in reality originated from the aberrant germs of the suprarenal capsule and pointed out that true lipoma of the kidney were of extremely rare occurrence. Thus, for instance, Ulrich found out of 34 instances of small yellow tumors and foci in the kidney which he examined and were formerly considered as lipoma, 9 times they were in reality accessory suprarenal bodies, 15 times fatty necrobiosis of the epithelium of the tubuli concorti, the so-called true lipoma, 10 times adenoma of the renal cortex or strumæ supra-renalis accessoriae, the author leaving the diagnosis undecided and in none of them, as will be seen, was a true lipoma found.

These small tumors occurring under the fibrous capsule of the kidney, not infrequently multiple, are generally not of any great

size. Nodules larger than a pea are to be considered as rare, while those attaining the size of a walnut represent the transition to those tumors which are characterized by a progressive growth and which in reality quite rarely occur in comparison to the frequency of the benign growths arising in the suprarenal body of the kidney.

The smaller types of tumors mentioned are, as a rule, pale yellow in color and of soft consistency; in the larger foci, hemorrhages and pigmentation which they have left, are often found. Frequently with the naked eye, always with a microscopic, a fibrous capsule can be recognized, showing the boundary of the renal tissue.

Histologically, most of the tumors arising from the suprarenal body are composed of cortical tissue of the suprarenal body; those forms arising by a pure hyperplastic process of the cells of the medullary substance are apparently rare, as well as those which develop in the cortical substance of the kidney. Virchow says: " that medullary substance does not occur throughout the normal suprarenal body, and therefore, one is very apt to take the intermediate layer itself for medullary substance." The older observations, in which the medullary substance was supposed to have been seen in aberrant germs of the suprarenal body, were in all probability instances of the presence of the cells of the zona pigmentosa. Manasse, however, has described a growth the size of a hen's egg, discovered by chance during an autopsy which was composed almost entirely of the specific elements of the medullary substance of the suprarenal body; clusters of dark brown to light yellow cells were present, separated from each other by thin strands of tissue. The smallest of these resembled normal medullary cells of the suprarenal body. Others were larger, square, or clubshaped, while still others were true giant cells of colossal dimensions presenting the most varied and peculiar shapes. The smaller cells formed tortuous lines or strands as found in the normal suprarenal body, while the larger ones presented themselves in irregular clusters.

The type of normal suprarenal body cells must always be present in tumors which have arisen from the dispersed germs of this organ, in other words, in the meshes of a well developed capillary network, forming the stroma of the tumor; the cells are arranged

in rounded heaps and columns, they being of large size and polygonal in shape. In giving a description of his cases, Askanazy says that "the capillaries above all form the stroma network, in the meshes of which the specific cells are present." Other authorities also have referred to this arrangement of the capillaries and Lubarsch considers his cases as angiosarcoma or perithelioma, a specification which can only be made by the close connection of the tumor cells with the capillaries; the development of these tumors from the adventitious cells of the capillary walls is out of the question, for the simple reason that the tumor cells have been derived from the specific organic cells.

The tumor cells generally contain a large amount of fat like the normal cells of the suprarenal body; complete fatty degeneration may arise, the tumor becomes softened from the formation of cysts in which hemorrhages may occur, so that the contents of the cavities are of a hemorrhagic or pigmented nature. Glycogen obtained from growths arising from the tissue of the suprarenal body has been referred to by Lubarsch.

The hisological structure of tumors arising from the dispersed germs of the suprarenal body is consequently typically different from that of normal kidney tissue; however, it must be pointed out that in the foci of suprarenal tissue, especially those having a progressive development, a gland-like arrangement of the exuberant elements may be detected, while beside the solid columns surrounded by cells, cavities form, which appear all the more gland-like because the cells take on a more cylindrical shape. An analogy of this transformation in the normal suprarenal body is not lacking, as has been shown by Marchand, especially in the loose and hyperplastic exuberances which have developed from the latter. Undoubtedly, just such tumors, which are about to be formed into a tube-like transformation were formerly described as true renal adenoma having an alvelolar structure.

The benign and simply hyperplastic tumors arising from the cells of the suprarenal body are thus made up, whether they develop from the main organ itself or from dispersed germs. It happens, however, that these benign growths which clinically give rise to those symptoms and only occasionally show something on section, give rise to a considerable growth without limits and appear clinically, as well as anatomically, to be milgnant in nature.

These tumors especially, and the cases here to be reported may be included among them, are both of clinical and anatomic interest.

Macroscopically, the malignant tumors of the suprarenal body, which may develop to the size of a child's head, appear in various fashions. This depends principally upon the metamorphosis undergone by the neoplastic tissue. Frequently, extensive necrosis occurs in the older central portions of the tumor. The pale yellow, necrotic foci are seen in great contrast to the fibrous capsule. From blood infiltration and pigment metamorphosis, the surface of section may have a very peculiar appearance. Occasionally softening of the necrotic masses results and from this fact the tumor may assume a cystic character. Calcification of the central portions of the growth has also been met with, as well as progressive peripheral extension.

The structure of these tumors as here described, varies more and more from the typical picture of the suprarenal body. The cells assume indifferent shapes, their pillar-like arrangement becoming indistinct. Transitions from the typical structure of the suprarenal capsule to a completely atypical arrangement is occasionally met with in various portions of the same tumor. These tumors arise from a purely hyperplastic or adenomatous production of the suprarenal body tissue and not directly from the dispersed normal germs themselves. If, in the malignant tumors, tissue resembling that of the suprarenal body is still to be found, it will always resemble the typical stroma of the cortex of this gland; normal suprarenal body tissue is probably never found, this being made evident by clinical observation by the long existence of a small tumor, which, only after a number of years, takes on a rapid growth and malignancy.

As far as the condition of the kidney in which the growth arises, is concerned, it ordinarily gives evidence of more or less extensive interstitial inflammation surrounding it. Frequently, the size of the affected kidney is quite considerably reduced. The functional activity of the renal parenchyma in the neighborhood of the growth is frequently destroyed as a result of atrophy and necrosis. Evidences of foreign growths arising from the renal parenchyma itself have not been observed in these tumors.

In most cases the suprarenal body covering the diseased kidney is intact; in a few instances it was included in the growth on ac-

count of the increase in size of the renal tumor. It occasionally happens, however, that the entire suprarenal capsule remains under the albuginea on the surface of the kidney and always at the upper pole. A neoplastic formation arising from such an obstructed suprarenal body can certainly not be designated as originating from aberrant germs of this organ. In such cases, of course, the suprarenal body on the same side must also be missing from its normal position.

A tissue capsule is characteristic of all tumors, benign as well as malignant, which have developed from the aberrant germs of the suprarenal body. Since the doubtful tumors are, as a rule, situated under the capsule of the kidney, a portion of the capsule belonging to the neoplasm must be formed from that of the kidney. The remainder of the capsule belongs from the very beginning to the neoformation. While in true renal tumors, which are also encapsulated, such as adenoma and fibrosarcoma, the capsule will be found to consist of recent or old granulation and cicatricial tissue, in which remnants of renal tissue, such as the glomeruli and urinary canals, can be demonstrated, as in infarct cicatrices (Lubarsch), the conclusion can consequently be drawn that these bands of tissue are produced by a sort of inflammatory neoformed tissue arising from the renal tissue; in the capsule of these tumors one rarely finds the remains of glomeruli and urinary canals arranged with any regularity and then only when the growths have extensively progressed. It can be readily understood that while the tissue of the kidney in the neighborhood of the neoplasm becomes destroyed and fibrous changes occur, new layers become added to the original capsule which may contain remnants of renal tissue. As Lubarsch says, it can be distinctly proven in many ways that those portions of the capsule, closely bordering on the renal substance have a different origin, because they are usually richer in cells and blood vessels and are almost always infiltrated with the elements of an inflammatory process. On the other hand, in other cases where the capsule is especially thin, renal tissue can nowhere be found. Thick septa of tissue shoot out from the capsule and separate the tumor masses from each other.

The stroma of these growths consists of thin walled capillaries which are often gaping or collapsed, forming dense meshes in

which the tumor cells lie directly on the vessels. No other stroma can be found in most cases. Thus the type of the normal suprarenal body structure again returns here. The real tumor cells are large, in fact larger than in the normal organ, and usually polyedric. Their nucleus is sharply defined, rounded, easily stained and shows from one to two nucleoli, which may also be easily and distinctly stained. This characteristic of the nucleoli is believed to be of great importance by Lubarsch, but, according to Kelley, this peculiarity is present in a large number of tumors having various structures. In the cell bodies are to be found distinct and regular vacuoles resulting from absorbed fat, while in fresh and carefully treated preparations, the fat infiltration of the cells can be distinctly seen in the form of large and small drops. This fatty cell infiltration, which is characteristic of the cortex of the suprarenal body, is an important factor, showing in cases of doubt that the growth originated from the suprarenal body and is a proof against Sudek's opinion, who claims that these growths are true renal adenomata. This peculiarity of taking up fat in large drops, without first producing destruction of the cells, in other words, a fat filtration, never occurs in the epithelium of the urinary canals. The glycogen contents emphasized as diagnostic by Lubarsch, is doubtless of considerable importance, but far less so than fat infiltration of the cells, because very marked glycogen contents are typical, not only in certain types of tumor, such as enchondroma, cancer of the testicle, sarcoma of the bone and so forth, but they may exceptionally occur in types of neoplasms in which it is usually not found (Langhans). This authority has demonstrated the production of glycogen in sarcoma and carcinoma of the kidney, whereas, Lubarsch in 12 renal neoplasms not originating from the suprarenal body tissue, was unable to demonstrate the presence of glycogen. One cannot produce a positive glycogen reaction in normal suprarenal body tissue, but it is frequently met with in tissues which normally show no glycogen reaction and which are not derived from the suprarenal body. Glycogen is found within the parenchymatous cells, as well as in the stroma and blood vessels; in the latter it is free, as well as enclosed in the leucocytes.

Lubarsch called attention to the presence of lecithin in these tumors and Gatti demonstrated it in his case, so that possibly it

may have some diagnostic value. But, since we have no microchemical reaction for its demonstration, and since a more extensive test would necessitate larger portions of the tumor, the demonstration of this substance is lacking to a large extent as to its probable differential diagnostic value.

Furthermore, the tumors show a marked tendency toward cellular degeneration. This tendency occurs to a great extent in benign tumors of the suprarenal body and in itself, does not form a special characteristic of the malignant type. In each of these tumors cellular degeneration exists more or less extensively. A reason for this degeneration is the frequent and profuse hemorrhage which, without exception, occurs in malignant neoplasms of the suprarenal body, while necrosis may arise in a very large portion of the tumor. The cause of these hemorrhages is due to the relationship of the tumor cells to the vessels and will be discussed further on. Remains of old hemorrhages, altered blood coloring matter in the form of fine pigment granules, are often found and which give rise to the reaction of iron. Karyorrhexis is frequently found, according to Lubarsch, as well as myxomatous degeneration and the formation of cavities, the so called cystic transformation, which are filled with a bile-like fluid, the result of mucous softening.

The arrangement of the tumor cells corresponds more or less with that of the suprarenal body, but nevertheless an atypical condition is often found. Even if the structure differs very greatly from the suprarenal body tissue, the origin of the growth is not of necessity to be refuted, because very frequently malignant tumors differ from the mother tissue in various ways, as is found in various forms of carcinoma of the breast, stomach and thyroid gland.

This difference in the histological makeup of hypernephroid tumors has been frequently demonstrated and sometimes alveolar, tubular or even trabecular arrangement has been mentioned. In this evident difference in the morphological or structural peculiarity, lies the cause of the discussion relative to its nature, which will be referred to later on. Usually the cells, especially those in the more recent portions in the outer part of the tumor, lie in two parallel rows without any intercellular substance. In other parts of the growth the cells are arranged in clusters, which are

bordered by capillaries. However, contrary to what is found in benign growths, the spaces between the neighboring capillaries are much larger and irregular. The first row of cells is fairly perpendicular to the capillaries, but the cells in the intermediate spaces are usually placed irregularly. In the islands of tumor tissue, clusters of small round cells are to be observed at certain points. The arrangement of the cells, as mentioned above, is frequently quite atypical and differs from the normal suprarenal tissue. Thus, gland-like formations, as well as cysts, have been described, when in reality one was dealing with suprarenal growths. Occasionally, papillary ingrowing of the epithelium into the lumen of the ducts of these spaces has been demonstrated and not infrequently blood has been found in these glandlike spaces.

It has already been mentioned that frequently the formation of cavities results from central degeneration of the cells, or by a separation occurring between the cells arranged in clusters from the presence of blood. Of greater importance, however, is the presence of real gland tubules and alveoli, and from the diagnostic point of view when these are found the suprarenal nature of the tumor has been doubted and for this reason Sudek considers these growths as renal adenomata. As has already been mentioned, however, such gland formation has been described in the normal suprarenal body and in benign suprarenal tumors, so, therefore, such a condition in malignant neoplasms arising from the aberrant germs of the suprarenal body can in no way appear strange. A condition of numerous glandular formations in renal tumors, which apparently are of suprarenal origin, should always lead one to be circumspect before making a diagnosis.

The relationship of the tumors to the vascular system still remains to be discussed. The neoplasms are interwoven by an extensive ramification of capillaries, in the meshes of which the neoplastic cells lie without the presence of any other stroma of vessel endothelium. Burkhardt found certain conditions of the endothelium of the vessels in his cases which are quite worth mentioning and he says: "in places an enormous endothelial growth was found. Although an overgrowth of epithelium in tumors, especially those of a malignant nature, is nothing unusual in it-

self, nevertheless I have not observed it to such a great extent in any other type of tumor, certainly not in one coming from endothelium. At the same time, the transition of the exuberant epitheloid formation which was assumed to be epithelial, was occasionally so diffuse, the similarity of both kinds of cells was so great, that a differentiation was no longer possible. It is probable that certain authorities who deny the suprarenal origin of these tumors have such histological pictures in mind and take them for endothelioma."

The intimate relationship of the parenchyma cells to the vessels is characteristic of normal suprarenal tissue. Manasse has called attention to a peculiar condition in the normal suprarenal body. This authority often found isolated suprarenal cells in the lumen of the veins, as well as some lying in small clusters in close proximity to each other. "Furthermore, projections of suprarenal tissue were often found to penetrate through the walls of the veins into their lumen and which consisted of suprarenal body cells exclusively. Therefore, I can demonstrate that a very intimate relationship exists between the suprarenal body tissue and the veins and of such a kind that not only an invasion of the cells occurs in the veins, but also projections of parenchyma hang down into the lumen of the vessel." Such close relationship naturally arises between the vessels and the cells of the malignant tumors originating from the suprarenal body tissue, as well as in the benign forms, for which reason the latter may also give rise to metastases with ease. Löwenhardt's case belongs to the latter category, in which a large tumor of the clavicula occurred as a primary growth. Microscopic examination of the tumor after removal showed a similar structure to suprarenal tissue and when the case came to autopsy, a benign tumor having a similar anatomic makeup was found in the kidney, along with many other metastases. Benign tumors then, which are developed from the suprarenal body, may give rise to secondary growths. That it is difficult to distinguish between benign and malignant tumors of the suprarenal body has been made evident by Hansemann and he says: "Every hypernephroma of the kidney is a malignant tumor. Just as carcinoma occurs, which may exist for years without taking on a rapid growth or producing metastases, so also relatively latent periods exist in the life of the hyperne-

phroma. Between a hypernephroma arising in the kidney as an isolated tumor reaching the size of a hazelnut and one which has produced hundreds of metastases, I am unable to find any radical histologic difference. One cannot appreciate the danger of its malignancy by merely examining a single section of the tumor."

The formation of metastases of malignant tumors of the suprarenal body takes place by way of the vascular system and only very infrequently by the lymphatics. Secondary neoplastic productions produced by embolism have been found in the lung, pleura, heart, ribs, spine, diaphragm, peritoneum, mucosa of the stomach, liver, pancreas, kidney, mucous membrane of the bladder and retro-peritoneal lymphatics. Nearly always the veins in close proximity to these growths, especially the renal vein, are found choked up with neoplastic thrombi. This characteristic in the formation of metastases characterizes the malignancy of these tumors quite sufficiently, beside their tendency to rapid growth. It is interesting to note that the metastases often represent the regular type of the structure of the cortex of the suprarenal body, whereas the primary neoplasm shows a different histological structure, a fact which has also been demonstrated in thyroid tumors. For example, Kelly mentions a case of adenosarcoma of the thyroid where the metastases in the kidney had been mistaken for the primary tumor. Tumors of the thyroid gland frequently grow slowly and form metastases frequently in the form of colloid struma clusters and also in the vascular tracts of the bones.

Clairmont reports an interesting case of dissemination of the tumor cells during operation. In 1894 nephrectomy had been done for a malignant growth of the right kidney and during the interference the right pleura was torn to the extent of about seven centimetres, the rent being immediately closed with silk sutures. Examination of the growth after removal showed it to be an adenocarcinoma (this term was then given to malignant tumors arising from the suprarenal body, at the Pathological Institute of Vienna). Nine years later the patient was again admitted, at which time he was suffering from dyspnoea, bloody sputum and considerable loss in weight. The right half of the thorax was retracted and depressed during respiration, and posteriorly, over the right there was dullness and compression

breathing. Puncture withdrew pus containing diplococci. The pulmonary abscess was opened by resection of the ribs. Soon after, the patient died and at autopsy a row of pedunculated reddish and dark blue excrescences were found on the mucous membrane of the right bronchial tube. The lymphnodes situated over the bifurcation were enlarged and adherent to the walls of both main bronchi. On the outer surface yellowish red soft excrescences, the size of a linseed, had developed. Microscopic examination showed that these growths coincided in structure with that in the kidney removed nine years previously and it was only at this time that the diagnosis of malignant hypernephroma was made. Large irregular cells were found with pale cell bodies and nearly regular vacuolar contents, which could be stained with eosin. The cells showed a very distinct nucleus and were arranged in rows.

Clairmont assumes that during the operation the region of the bronchial glands and pleura had become infected with the tumor cells and that these were carried by the lymph stream into the bronchial glands where they remained and developed secondarily.

According to Grawitz, the following arguments are of importance for the diagnosis of these malignant tumors originating from the aberrant germs of the suprarenal body in the kidney: (1) Under the renal capsule dispersed germs of the suprarenal body often occur. (2) The cell formation of the tumors typically differs from the shape of the epithelium of the urinary canals. (3) Fat drops when found in most of the tumor cells, are also frequent in the cortex of the suprarenal body. Fat infiltration of the urinary canals never occurs. (4) The tumors are always encapsulated. (5) The arrangement of the cells and the very scanty stroma, which may be almost absent, is characteristic of the suprarenal body. (6) The glycogen and lecithin contents of the tumors are of lesser importance. (7) The hemorrhages and the resulting retrogressive metamorphoses should also be included among the characteristic signs of malignant growths, and above all, their tendency towards progressive development and the formation of metastases.

The relationship between suprarenal body tumors in the kidney and true renal neoplasms at first sight appears peculiar,

because it seems strange that cell germs not belonging to the organ should so frequently produce neoplastic formations in the kidney. However, as Kelly has said, as inconsistent as this proportion of suprarenal tumors in the kidney may appear, as compared to other renal neoplasms, it is without analogy in the present knowledge of tumor formation, nor does it under the prevailing theories offer any especial difficulty. Experience has shown that complex cells, possessing a very fine differentiation and very great physiological functions, far from the ordinary simple cell life, occur relatively infrequently in organs as the seat of primary neoplastic productions. Ganglioneuroma and hepatic cell adenoma are quite rare as compared to the occurrence of those formations in which the surface epithelium of the skin and mucous membranes is rapidly consumed and again regenerated, which alternatively proliferate and again involving the epithelial lining of the uterus and thymus gland, or the complex cells of the genital organs which are physiologically designed for regeneration. Comparing the highly differentiated and specific functionating cells of the renal epithelium with those of the hepatic parenchyma, we cannot expect to meet with very frequent occurrences of the primary kidney neoplasm and consequently must consider this rarity together with what we know of other parenchyma in general. The suprarenal body, on the other hand, is an organ which in its development and its probable vital functions possesses some similarity with the thyroid gland, more particularly on account of its epithelial origin and the poor development of an excretory canal; the neoplasms, as has already been mentioned, also show a great similarity. Types similar to adenomas and metastases by way of the blood vessels, the multiplicity of the histological structures in the same tumor, the long duration of certain functions, as colloid in one and formation of fat in the other, are common in them. It is remarkable that neoplasms of both these organs seem to have a certain tendency to arise in parts of glands occupying the abdominal cavity. We are reminded of the aberrant germs of thyroid gland strumae in the substernal space, at the base of the tongue, and trachea, in the cellular tissue of the inferior triangle of the neck.

Concerning the position of neoplasms arising from germs of the suprarenal body, especially of the malignant type, in the

oncologic system, much discord has arisen among authorities. The tumorlike hyperplasias situated on the suprarenal bodies themselves were termed strumae suprarenales by Virchow. Grawitz, who demonstrated the real nature of renal neoplasms which were formerly described as lipoma and arising from aberrant germs of the suprarenal body, applied the name of strumae lipomatosae aberratae renis, as did also Virchow. Later on the term adenoma was adopted by many, on account of the supposition that the suprarenal capsule is a true gland, possessing an internal secretion. The malignant tumors arising in the thyroid gland are described as carcinoma and, according to Burkhardt, the malignant tumors of the suprarenal capsule should also be considered as such, the benign types being adenoma. "In every gland carcinoma three forms may be observed—the destructive adenoma, carcinoma simplex and medullary carcinoma. Generally, in carcinoma of the suprarenal gland these three types of structure are more or less intermingled and it follows from this peculiarity that many variations and atypical conditions occur in the structure of these growths." On the other hand, Borst says: "According to the morphological definition, the suprarenal capsule in a normal condition cannot be termed a gland in the strictest sense of the word, nor can we attribute the character of the neoplasms arising from this structure as glandular productions of an adenomatous character. The structure of the tumors only shows here and there, and that exceptionally, histologic pictures recalling tubular or alveolar gland spaces, according to the statement of many. Then again, the history of the development of the suprarenal body is by no means definitely known. It has been recently upheld that this organ is derived from the kidney or the coecum. Taken for granted that the epithelial origin of the suprarenal body is unquestionable, the fact still remains that the characters of a true gland are not evident in the makeup of a normal and perfectly developed suprarenal capsule. The structure of this organ rather resembles the so-called vascular glands, more especially the so-called glandulae carotica, whose mesodermic, or rather mesenchymal, origin is probably unquestionable. The resemblance of the normal structure of these two organs is also made evident by the neoplasms to which they give rise."

In spite of the decidedly epithelial character of the tumor cells, malignant growths of the suprarenal body have generally been called sarcoma (Grawitz, Benecke), partly because a definite demarcation between the stroma and parenchyma does not exist, while the framework of tissue not only surrounds the filled-up alveoli and other cell spaces in the parenchyma, but also penetrates between them; also from the fact that such growths, particularly in the older portions, give rise to a histologic makeup very similar to sarcoma, while the more recently developed portions give the impression of an epithelial growth. From a purely morphological standpoint these tumors should be termed sarcoma on account of the very distinct penetration of the stroma and parenchyma (Graupner). This authority asserts, on the other hand, that the solid lines of cells in the cortex of the suprarenal body and in the aberrant germs, come from organs in which transmission from solid cell rows to tubular formations occur, and vice versa they arise in various stages of embryonal development only infrequently. Those tumors arising from these germs retain the nature of the mother cell and they also give evidences which would seem to indicate the commencement of the development of gland spaces. If it is shown that the suprarenal body and its aberrant germs arise from true epithelium, it is pointed out by Graupner that then tumors of the suprarenal body may represent epithelial formations and consequently the malignant types may be placed under the head of carcinoma.

The morphological characteristic of suprarenal tumors, especially the intimate connection of the tumor cells with the vessels, caused Hildebrand and de Paoli and Driessen to consider them as endothelioma. While their predecessors claimed that they originated from a proliferation of the endothelium of the lymph spaces, they attributed them to an overgrowth of the perithelium of the blood vessels and the endothelium of the lymph spaces, a periendothelium.

The conception of the renal tumors in question being adenomatous, arising from an overgrowth of the epithelium, cast off from the urinary tubules, as Sudek and others claim, has been disproven by Lubarsch, Askanazy, Ulrich, Manasse, Gratti and others, so that their error was at length proven.

Birsch-Hirschfeld suggested that adrenal tumors should receive an indifferent name until their origin and place in the oncological system was made perfectly clear, and suggested hypernephroma as a proper term. Marchand objected to this expression because the final syllable "oma" is not annexed, as is usually done, to the tissue element relative to the tumor, but to the entire organ from which the growth arises.

Borst also recommends selecting an unprejudiced name for all growths arising from the adrenal gland and its aberrant germs. He, therefore, suggests speaking in general of typical and atypical hyperplastic benign and malignant tumors of the suprarenal type, a suggestion which certainly deserves notice, although the demonstration of the epithelial character of these tumors should have more weight.

The clinical importance of renal neoplasms originating from aberrant germs of the suprerenal gland is very considerable, because the diagnosis has not yet been made before operation. It is only at the operation, and, then only by careful examination of the removed tissues, that the origin of the growth has been made clear. However, as has been shown by numerous articles on the history of the subject, in doubtful cases the diagnosis can be made with much probability and radical operation can be applied accordingly. One can hardly be certain clinically of the difference between benign and malignant growths of the kidney of the suprarenal type, because, on the one hand, most benign growths of this type run a course without giving rise to any clinical symptoms, while, on the other, from the pathologic standpoint, the benign neoplasms prove to be malignant.

These neoplasms are by no means rare as compared with other renal growths and since Grawitz has demonstrated their nature, it has been proven beyond a doubt that many of those instances reported as sarcoma or carcinoma of the kidney, belong to tumor formations developing from the suprarenal tissue and it was found that they occurred more frequently than primary renal sarcoma or carcinoma.

As to the age at which these tumors develop it has been noted that only in two cases due to Rupprecht (child two and one-half years of age), and Linser's case (male child five years and nine months old), have they been found under the age of thirty. In

Linser's case the diagnosis was certain, while in Rupprecht's case there was a rapidly growing retroperitoneal tumor which was removed by operation. Child died a few years later with large metastases of the lung. Histologic examination showed an encapsulated growth the size of a child's head, composed of large pale cells having a tube-like arrangement. Prof. Neelsen made a diagnosis of suprarenal tissue tumor and called the growth an adenoma suprarenale. Most cases, however, have been met with between the thirty-seventh and sixty-fourth years of life. They appear more prevalent in the male sex, although this may be merely a coincidence.

Even after the tumors have given rise to clinical symptoms they may persist for some time, as much as from two to six years, before causing death. Usually, however, after existing for a short time, they tend to grow rapidly and give rise to metastases. Askinazy's case is unique; the patient, fifty-four years of age, had discovered the tumor in the left kidney when he was a child. Later on the tumor is supposed to have disappeared and was only again noticed one year before the operation.

The existence of a suprarenal growth, often for many years, giving rise to only a slight amount of pain, makes it more probable that in the beginning simple hyperplasias develop from the aberrant germs of the suprarenal capsule. If these grow exuberantly they resemble typical struma of the suprarenal body. As such, they may attain quite a considerable size, as is usually the case, before they give clinical evidence of a malignant growth and even symptoms of disease.

The symptoms pointing to this affection are usually trifling and are frequently far out of proportion to the real seriousness of the condition. The tumor makes its presence known by very slight dragging pains, often radiating towards the bladder, or by a constant feeling of weight in the renal region, until finally a tumor can be palpated or hemorrhages occur. The general condition remains unchanged, while a bronzing of the skin rarely arises.

A unique case is recorded by Linser in a boy five years and nine months of age, where a tumor in the left kidney was discovered, the child having a markedly giant growth. On section the tumor was found to be malignant and of suprarenal origin.

The suprarenal body on the same side could not be found, while that over the other kidney was normal. Linser assumes that the suprarenal capsule had an influence on the general body growth and questions whether the aberrant germs of the suprarenal body had not given up their specific regulating functions, on account of the premature separation from the mother tissue.

Some authorities have raised the question of malignant degeneration, and de Paoli, for example, found a movable kidney, Braatz a movable kidney, and Busse a movable kidney in his tenth case. Grohé, in his seventh case, found the same condition, the movable kidney having been present for twenty-seven years.

Gatti considers that traumatism was the etiological factor of the tumor in his case. Eight years before the operation the patient fell on her back and right side; six years later evidences of a malignant tumor of the right kidney became apparent.

Whether these conditions have any causative relation to the malignant degeneration, or whether they should be regarded as simple coincidences, still remains undecided and then again, records of such cases are still too few. In the three cases that I here report, the cause of the malignant degeneration could not be made evident.

Symptoms resulting from the primary renal tumor may be entirely wanting, while those due to the metastases may be prominent. Among such instances may be mentioned Löwenhardt's case, already referred to, in which a tumor of the clavicle was removed and proved histologically to be a metastasis from a suprarenal tumor and at autopsy the primary growth was found. Grohé has reported the case of a patient, otherwise in apparently perfect health, who developed a tumor of the tuber frontale following a traumatism and for which he came to the clinic. By careful examination a very large tumor was discovered in the right renal region and after the growth had been removed, evidences of metastases of a malignant suprarenal growth of the kidney was found. In this case no symptoms had preceded which gave any clue as to the presence of a renal tumor, which was only found by chance during a careful examination.

The initial appearances then, due to an overgrowth of aberrant germs of the suprarenal body are in most cases so

slight and indefinite that the patient attributes little importance to them, while the symptoms are usually attributed to rheumatism.

As soon as these growths commence to develop malignantly, hemorrhage from the kidney takes place in eighty per cent. of all cases and this occurrence is what decides the patient to consult a physician. This hematuria is intermittent; frequently it arises suddenly and unexpectedly, while in other cases it results from a slight strain, as, for example, in one of our cases, where it followed difficulty in the passage of the stools, while in another it arose after palpation of the renal region. A slight dragging pain may be complained of, there is difficulty in micturition and pure blood, or blood mixed with urine, is voided; especially after cessation of the hemorrhage, vermiform blood clots are passed in the urine. Pale, colorless clots are especially characteristic, as well as those which are passed in perfectly clear urine, because they are certain to have originated in the ureter. A direct cause for the hemorrhage is not usually discovered and in most cases it apparently takes place spontaneously. In the first case which I shall report hematuria always occurred after palpation of the diseased kidney. The frequent occurrence of renal hemorrhage is easily explained by the anatomical structure of the tumors and it is to be noted that pathologically benign suprarenal tumors of the kidney may also give rise to hematuria. Grohé has given warning not to consider every renal hemorrhage as due to a renal neoplasm and he says: "It is erroneous to immediately think of a renal tumor whenever a patient presents a one-sided hematuria. Special contributions on kidney growths naturally show that hematuria is an important symptom, but, if special articles pertaining to renal diseases are carefully perused, it will at once be seen that hematuria is frequently considered as an unimportant symptom as it at once becomes evident in König's recent work, which appeared in the fifty-fifth volume of the *Deutsche Zeitschrift fur Chirurgie.*"

He also calls attention to instances of hematuria which have been met with in apparently healthy kidneys, aside from the fact that the source of the hematuria is to be found in deeper urinary passages, or on the other hand, the origin of the blood may remain a matter of doubt, at least for a certain time.

In large suprarenal tumors of the kidney, palpation will reveal them, and enormous growths have been described, but it is just in the smaller ones which are commencing malignant degeneration, and where so much depends upon an early diagnosis, that palpation is of no use. In the first two cases here reported, in spite of the fact that the tumors had attained the size of a hen's egg, and extended over the upper surface of the kidney, nothing could be made out by palpation and Küster has pointed out that palpation is rendered more difficult for the reason that usually the middle of the kidney is the seat of the tumor, because in 194 instances which have been carefully recorded the growth arose in the middle of the kidney in eighty, from the lower pole in sixty, and the upper pole in fifty-four. Consequently, on account of the hidden position of the smaller tumors, not much diagnostic knowledge can be obtained from palpation of the kidney.

As to the frequency of the various symptoms, Grohé found that out of seven cases, in five slight pain had been present over a period varying from six months to two years, in two there was no pain, in six a palpable growth had been present for from two months to three years and in one no tumor could be felt, in six hemorrhages had been present for six weeks to two years, and in one no hemorrhage had ever occurred.

The differential diagnosis is difficult and in spite of carefully considering each symptom, a diagnosis of malignant renal growth is often all that can be made, and still from the standpoint of treatment it is of the greatest importance to ascertain as nearly as possible the nature of the growth before operation. Carcinoma is the nearest tumor to the suprarenal type, clinically speaking. Nevertheless, the rare primary cylindrical cell carcinoma and the rarer instances of flat epithelial cancer arising from the epithelium of the renal pelvis, run a clinically different course from the more ordinary renal growths of the suprarenal tissue type.

As far as the difference in frequency between carcinoma and suprarenal tumors of the kidney is concerned it may be said that Grohé found, out of eleven renal neoplasms, seven times tumors of the suprarenal tissue type, one diffuse infiltrating growth and two carcinomas of the renal pelvis. Primary renal

sarcoma is still more rare, excepting the malignant renal growths met with in early childhood.

There is no difference as regards the age at which renal carcinoma occurs and those tumors originating from disseminated suprarenal germs, as both develop almost exclusively after the age of thirty.

There is one important point to be noted and that is that renal carcinoma, even more than sarcoma, gives rise to hematuria much less frequently than suprarenal growths. In them hematuria is only observed in about fifty per cent. of cases, and particularly in adenosarcoma it may often be lacking, whereas in malignant suprarenal growths it is found in about eighty per cent. of all cases.

(*To be concluded.*)

A CASE OF VESICO-INTESTINAL FISTULA.

From the Surical Clinic of Prof. Dr. von Bramann, Halle, Germany.

By Dr. Johann Mittag, Wittenberg, Germany.

THIS case has been deemed worthy of publication, because so far as I have been able to ascertain no exactly similar case has as yet been published, and as voluntary assistant to the Surgical Clinic of Halle, the case was under my direct observation.

The patient, a male 38 years of age, gave the following history. His mother had died of pulmonary tuberculosis, his father living and well. Other than the ordinary diseases of childhood the patient stated that he had always been well until 1896, during which year he was treated for cystitis, remaining in the hospital for three weeks. He left considerably improved, although not cured.

The right testicle had been swollen since the Summer of 1901 and it finally ruptured spontaneously, giving issue to a certain amount of yellowish green pus, the process resulting in a fistula. The left testicle has only become involved within the last few days according to the patient's story, because he had only noticed the swelling very recently.

It would appear that the urine had been cloudy and contained

flakes immediately after being voided for considerable time past. The patient has also noted upon frequent occasions the exit from the urethra of several small greenish-yellow drops of pus, also mixed with blood. For the past two years the stools have been frequently thin and fluid, but for the two weeks previous to entering the hospital he has suffered considerably from diarrhoea. According to the statement of the patient's physician anuria has been present for fourteen days.

Now, since such conditions are usually dependent upon an obstruction of the ureters the patient was prepared for cystoscopic examination. It was stated that the bladder was first irrigated, but when the catheter was introduced only several ccm. of a slimy chocolate colored matter was voided and which appeared to have a fecal character. The bladder contents had an extremely disagreeable odor, was only slightly fluid and in no respect did it remind one of urine. Since, however, the histological examination could not be immediately undertaken and also for the reason that such masses may be voided in advanced purulent processes of the kidney and bladder, particularly in instances of necrosis of the vesical wall, it was decided to still further irrigate the bladder.

It was very soon observed, however, that, although several litres of a borax solution were introduced, the patient did not experience the slightest discomfort in the bladder and by percussion the organ did not give any evidence of distension. On the other hand, the patient very soon gave evidences that the fluid reached the rectum because he passed several litres of liquid containing only a few particles of the contents of the rectum. Although this condition of affairs made things quite clear without any further signs that an abnormal communication existed between the bladder and some portion of the intestine and that again, even if one could locate this communication at about 1 metre above the ileo-coecal valve, on account of the amount of fluid which could be introduced and retained, it was thought nevertheless advisable to clear up all doubt that this liquid and diarrhoeal contents passed by the rectum, represented the stool. Consequently, for this purpose, some methylene blue was added to the irrigating fluid and after it had been introduced into the bladder, it was not long before the patient complained of a desire to empty the bowel and the blue

stained borax solution was expelled per rectum. Thus, the diagnosis of a vesico-intestinal fistula was demonstrated.

Since the patient had been in the medical clinic some years before, at which time he presented a liquid collection in the abdominal cavity and since also before the occurrence of the vesico-intestinal fistula he had suffered from diarrhoea, one could make with quite a degree of certainty the diagnosis of a tuberculous peritonitis and for this very reason it might be presupposed that the process which had given rise to the communication between the intestine and the bladder was of a tuberculous nature. If all this data had not been sufficient for a diagnosis, the existing tuberculosis of both testicles along with a right-sided tuberculosis of the vas deferens and seminal vesicle would have been sufficient to have settled the question.

The patient's general condition was such that any interference of long duration, such as resection of the bowel and closing the opening in the bladder, could not for a moment be considered. Consequently, the only treatment to be resorted to was to improve his strength and general condition in order, if possible, to place him in such circumstances that he might be operated upon later on.

In spite of a permanent catheter, almost all the urine passed through the intestine and was voided per rectum, from which fact it was surmised that the communication between the gut and the bladder must be large; and then again this liquefaction of the loose tuberculous stools caused them to become so thin that the patient was constantly annoyed by frequent desires to empty his rectum of its watery contents, a fact which disposed of any thought of interference by way of the rectum. Now, since the nourishment requisite to retain life could only be given with difficulty and in small quantities to such a greatly weakened patient, it was decided to give the nutrient enema through the catheter introduced into the bladder. By this means, not only the large intestine, but also the greater portion of the ileum could be used. Naturally, the enemas were composed of non-irritating substances, such as milk, unsalted flour and milk soups, with cane sugar, etc. In spite of all this the physical strength of the patient declined progressively and he finally succumbed without operation.

The most important facts of the autopsy will only be men-

tioned. The pelvis was removed along with the penis, testes and spermatic cords, as well as the ureters and kidneys. The preparation showed that the left kidney was somewhat hyperemic and had undergone a compensatory hypertrophy to a slight degree and that the pelvis of the kidney was normal. The right kidney, on the contrary, had to a certain extent an embryonal aspect, the separate renculi could be still differentiated one from another and although diminished in its entire size, it was completely filled up by caseous and partly hardened tuberculous masses down to its fibrous capsule. As was also clinically assumed, both testicles were completely disorganized by caseous tuberculous masses, while the diagnosis of tuberculosis of the vas deferens and right seminal vesicle was verified by autopsy.

Upon the serosa of the small intestine, especially of the ileum, about 1,000 miliary tubercles were scattered. The mucous membrane of the bladder could hardly be recognized as such on account of the hard, fibrous degeneration which had taken place, along with extensive epithelial defects. There was no sign of an internal sphincter, which had become completely transformed by ulcerative tuberculous processes. On the posterior wall of the bladder, just above the floor of the organ, an ulceration the size of a pea was discovered with its long axis running crosswise, while at about 1 centimetre above this, directly towards the promontory, was seen a depression about the size of a walnut which represented the communication between the intestine and the posterior bladder wall. On the posterior aspect of this depression were found three perforations about the size of a pea and through these a sound could be introduced into the obstructed intestine.

EDITORIAL.

THE PERSISTENCY OF PAIN FOLLOWING NEPHROPEXY.

IN the early part of last year, Lucas-Championnière published a clinical lecture on movable kidney, in which he reported forty-three operations followed by success. The pains stopped and the neurasthenic symptoms gave way little by little.

It must, however, be admitted that there are cases in which the expected improvement does not come about, and unsuccessful cases are found under two different circumstances, namely, when there has been a diagnostic error, that is to say, when painful phenomena are due to some disease in another organ and which have been attributed to a movable kidney; and secondly, when the kidney, after operation, has broken away from its attachments and becomes fixed in a defective position, as Taylor has recently pointed out.

An error in diagnosis is certainly frequent. Take, for example, a patient who presents both biliary colic and a movable kidney. The mistake is made by attributing the pain to the kidney, which in reality is due to biliary lithiasis. Under such circumstances it is quite natural that fixation of the kidney produces no improvement, for the simple reason that the pain is due to the process in the other organ. The same observation may be made relative to lesions of the appendix, the tubes or the ovary. One should not compromise the kidney where in reality the trouble is due to an inflammatory condition of the latter organs and for this reason, before resorting to an operation on the kidney, one should be positive as to his diagnosis.

Generally speaking, a movable kidney, giving rise to pain, will itself be found sensitive on pressure and one should be extremely reserved should a movable kidney be painless when palpated. Under these circumstances it is better practice to look for the cause of the pain elsewhere.

After operation on the kidney, the pain may persist for the simple reason that the organ has broken away from its attachments ,and in order to avoid this unfortunate result, the technique advocated by Lucas-Championnière may be followed. Carefully free the renal parenchyma and pass catgut sutures directly through it. Three groups of double sutures, sometimes even five or ten, should then be brought out through the muscles and aponeurosis and tied up as high as possible. Taylor reports the case of a woman who continued to suffer after operation; the pain soon became paroxysmal, recurring for from three to five days every month and necessitating rest in bed. The kidney was exposed a second time and was found to have become twisted and fixed low down. The organ was sutured to the last rib which put an end to the pain. In another case the pain continued after operation and a second intervention was necessary. The kidney was found fixed low down and was adherent over its entire posterior surface so that decortication became necessary. Fixation in a normal position resulted in a cure.

ABSTRACT DEPARTMENT

IN CHARGE OF

FREDERICK BIERHOFF, M.D.,

OF NEW YORK

"Thiosinamin, an Aid in the Treatment of Urethral Stricture."—REMEK. (*Centralbl. f. Erkr. d. Harn. u. Sexual Org.,* April, 1905.)

Remek employed this drug in a series of twenty cases of narrow, medium, and wide-calibred urethal strictures.

One gramme of a fifteen per cent. alcoholic solution of the drug was injected between the skin and muscles of the back, as a rule twice a week. He warns against the danger of cutaneous necrosis, as a result of intra-cutaneous injections. To avoid pain, in the injections, they employed a few centigrammes of a one per cent. cocaine solution.

The best results were obtained in medium-calibred strictures.

"A Case of Large, Congenital Vesical Diverticulum."—MEYER. (*Centralbl. f. d. Krankh. d. Harn. u. Sex. Org.,* June, 1905.)

Meyer reports the case of a male of forty-three, who had suffered from repeated attacks of cystitis over a period of twenty-five years. For two years preceding the examination, the patient had been forced to use the catheter regularly. The cystoscope revealed a large diverticulum on the right side, or a double bladder.

"On the Physical Therapy of the Urinary and Sexual Apparatus."—LASKOWSKI (*Centralbl. f. d. Krankh. d. Harn. u. Sex. Org.*, June, 1905.)

Laskowski recommends vibration-massage in the treatment of old prostatitis with induration, prostatic neuroses, relaxation of the gland, and impotence. He further describes a modification of his prostatic percussor.

"The Treatment of Gonorrhoeal Epididymitis and Prostatitis With Mud Baths and Mud Poultices."—SCHMIUCKE. (*Centralbl. f. d. Krankh. d Harn. u. Geschl. Org.*, June, 1905.)

S. recommends these measures, which he has employed in the above variety of cases. He employs the baths at 40° C., for twenty-five minutes, on two successive days, each bath being followed by a hot pelvic bath for two hours. The treatment covers a period of several weeks. That is, in recent cases.

"Hypernephroma Renis." KUZMIK. (*Beitr. z. klin. Chir.*, February, 1905.)

Kuzmik reviews the histology, etc., of these tumors, and reports three cases.

He states that hematuria is the first reliable symptom of hypernephroma. The urine is evenly discolored, and long, thin blood-coagula, showing constrictions, are not only suspicious, but, according to experience, a certain sign of this condition. The hematuria is usually preceded by a dull pain, referred by the patient to the affected side. The tumor usually causes the patient no discomfort, as long as it does not, through its large size, cause pressure, or traction symptoms. The growth of the tumor is irregular. All of K's patients had passed the fiftieth year; two were males, one a female. One male and the female recovered from the operation, the latter dying sixteen months later, of a nephritis. The therapeutic indications are extirpation of the diseased kidney, if the other kidney is healthy and capable of performing its functions properly. His preference is for the lumbar incision. The contra-indications to an operation are severe organic disease of other organs, and the presence of metastases.

"Radical Cure of Urethral Strictures by Means of the Electrolytic Needle." SELHORST. (*Dermatolog. Centralbl.*, February, 1905.)

The author describes his method of procedure as follows: The stricture is first dilated (by means of bougies, or internal urethrotomy), to 23 French, before the electrolytic treatment is begun. The urethra is then thoroughly irrigated with a solution of oxycyanate of mercury. The urethroscopic tube is passed through the entire stricture and then withdrawn until the stricture presents in the lumen of the tube. The insulated electrolytic needle, which ends in a sharp platinum point of $1\frac{1}{2}$ to 2 cm. in length, is connected with the negative pole of the battery, and inserted $\frac{1}{2}$ to 1 cm. deep into the strictural tissue. The current is completed by a wet sponge electrode, placed upon the thigh, and connected with the positive pole of the battery. Four to six milliamperes of current are used for about three minutes, after which the operation is repeated at another part of the stricture. Four to six treatments comprise a sitting, and these sittings are repeated at first twice a week, later weekly. Each sitting is followed by an irrigation of the oxycyanate solution. During the course of treatment, bougies are passed once a week, and followed by an irrigation of 1-4000 solution of nitrate of silver, to promote resorption, and to preserve the lumen of the urethra. The author claims that his results are excellent.